Bulletin 38

SURFICIAL GEOLOGY OF MOUNT DESERT ISLAND

A Visitor's Guide to the Geology of Acadia National Park

by

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68°27'30" 25' 20' 15' 10'

44°27'30" 25' 20' 15' 44°12'30"

EXPLANATION

SURFICIAL MATERIALS

Holocene

- Hb — **Beach** - Deposits of gravel and sand formed by wave action along the ocean shore.
- Hs — **Salt marsh** - Flat coastal grassland flooded by the sea at high tide.
- Hw — **Freshwater wetland** - Flat, poorly drained area in which there is accumulation of organic-rich sediments. May be open or partly forested.
- Ht — **Talus** - An accumulation of angular rock fragments that have moved downslope mainly by the action of gravity. Generally restricted to the lower parts of steep hillsides.

QUATERNARY — Pleistocene (Wisconsin Glacial Stage)

Emerged marine sediments - Sediments deposited in a marine environment when relative sea level was higher than at present. These deposits have been divided into three groups based on coarseness of the sediments:

- Wec — Coarse-grained sediments (gravel) - Local concentrations of pebbles, cobbles, and boulders that were deposited as beaches and bars along former shorelines.
- Wef — Fine-grained sediments - Blanket deposits of silt, clay, and sand laid down in quiet-water environments on the sea floor.
- Weu — Undifferentiated sediments - Marine sediments that have been mixed by wave action and thus are difficult to distinguish as either coarse-grained or fine-grained. May include areas of Wec or Wef.

Glacial stream sediments - Sand and gravel that washed out of melting glacial ice. Includes two principal types of deposits:

- Wgo — Outwash - Deposited in meltwater streams in front of the glacier margin.
- Wgd — Delta - Deposited into the sea (1 = older, 2 = younger).

- Wm — **End moraine** - A ridge composed of mixed rock debris (ranging from clay to boulders) deposited along the glacier margin.
- Wt — **Till** - Heterogeneous mixture of sand, silt, clay, and stones deposited directly from glacial ice.
- rk — Undifferentiated bedrock and areas of thin drift cover.

SYMBOLS

Striations - Arrow shows direction of former glacial movement as indicated by scratches and grooves cut into bedrock. Dot indicates point of observation.

Minor end moraine - Shows location and trend of end-moraine ridge that is too small to be outlined by a contact line.

Meltwater channel eroded by glacial meltwater.

SITES OF GEOLOGIC INTEREST

(1) Location of site

1. **Glacial striations.** Park in the lot on Route 3 immediately south of the entrance to the Park Loop Road near the north end of the pond called the Tarn. Across Route 3 to the east is a rock face of granite which was highly polished by the glacier. Closer examination of the granite will reveal numerous striations and chatter marks. *See Figures 18 and 19.*
2. **U-shaped valley.** At the same location as #1 walk down to the north shore of the Tarn and look towards the south. Notice how the glacier eroded the east and west sides of the valley into a "U" shape. *See Figure 22.*
3. **Glacial plucking.** From the parking lot at Sand Beach, walk to the eastern end of the beach. Looking towards the northwest, note the steep ragged cliff formed by glacial plucking on the south side of the hill called The Beehive. *See Figure 20.*
4. **Marine clay.** Park in the right-hand lane of the loop road where it crosses Otter Cove and walk back to the eastern end of the beach. On the slopes at this end of the beach you can see exposures of greenish-gray marine clay. The slopes of the hill are eroded and gullied, a very characteristic feature of this type of material.
5. **Glacial meltwater channel.** From the same location as #4 look to the north. The notch between Cadillac Mountain and Dorr Mountain is a former glacial meltwater channel.
6. **Glacial sculpting.** Park near the Jordan Pond House and walk down to the shores of the pond. To the north across the pond you will see two smoothly rounded hills called The Bubbles. Notice how glacial ice streamlined the profile of these hills. *See Figure 21.*
7. **End moraine.** At the same location as #6 you are standing on an end moraine deposited by a glacier. The mound of debris that forms the moraine acts as a dam, holding in the waters of Jordan Pond. The boulders strewn about the field below the lawn are characteristic of these deposits. *See Figure 24.*
8. **Glacial erratic.** Park at the turnoff just south of the trailhead for the Bubble Rock trail (there is an interpretive sign here describing this balanced boulder). Look up at the slopes of South Bubble Mountain and you will see a large boulder deposited there by glacial ice. *See Figure 23.*
9. **Gravel beach.** Park in the Seawall picnic area parking lot and walk to the beach. Notice the size of the materials that make up the beach, and how the raised ridge of coarse material makes a natural "seawall." *See Figure 28.*

N

1 0 1 Mile
5,000 0 5,000 Feet
1 0 1 Kilometer